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DE 004012464 A DE 003908247 A US 3799218 A

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(58) Field of Search

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(54) Abstract Title

Oxygen dispenser

(57) An oxygen dispenser for dispensing substantially pure oxygen or highly oxygen enriched air comprises an oxygen concentrator 2 or an oxygen/oxygen-enriched air-containing cylinder in fluid communication with a dispenser outlet 5 via pipework 4 and a flow control valve to control flow of oxygen or oxygen-enriched air to the dispenser outlet 5. The flow control valve 15 under the control of a controller the dispenser unit further having a card reader 8 for a mag-stripe, swipe card, smart card or similar or a receiver for credit tokens or other data credit input means whereby credit units may be input to the dispenser controller to dispense oxygen or oxygen enriched air. The outlet 5 may comprise a socket to which a nasal cannula or a tube leading to an oxygen mask may be detachably coupled.

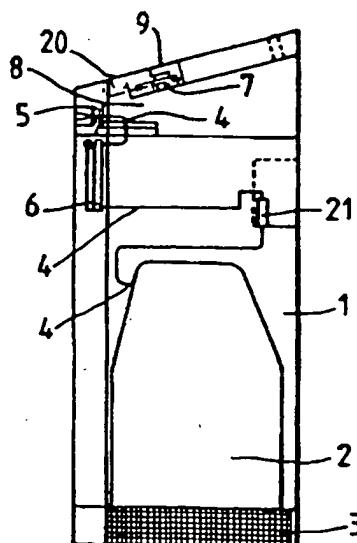


Fig. 4

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1995

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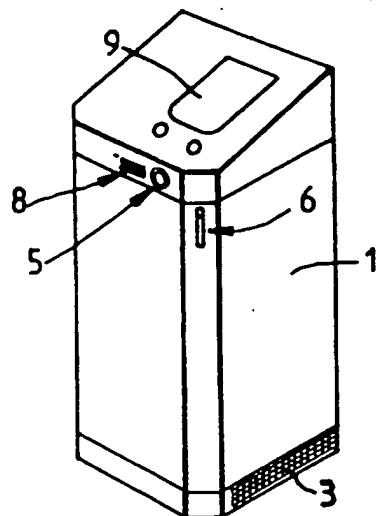


Fig. 1

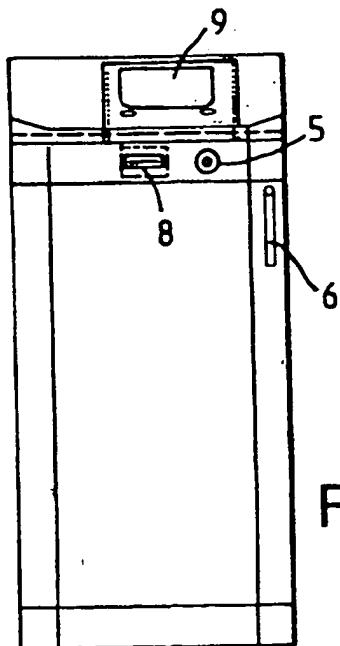


Fig. 2

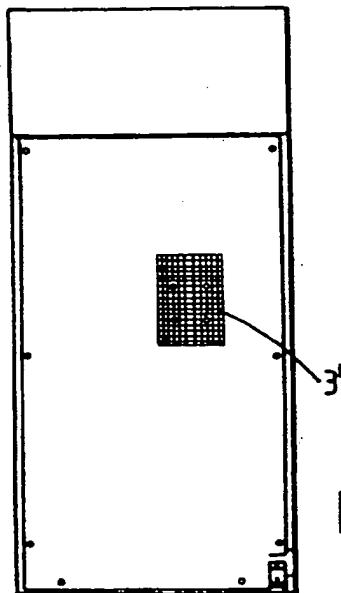


Fig. 3

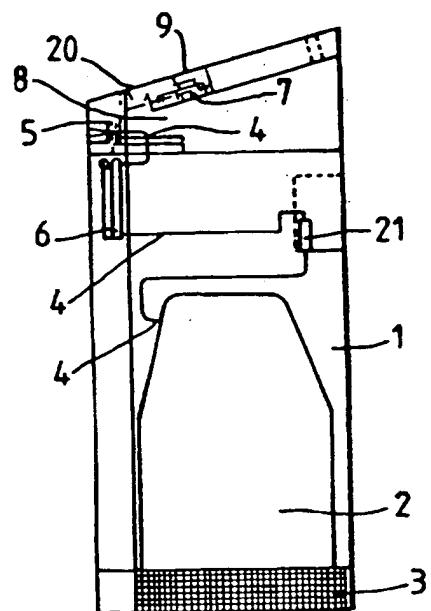


Fig. 4

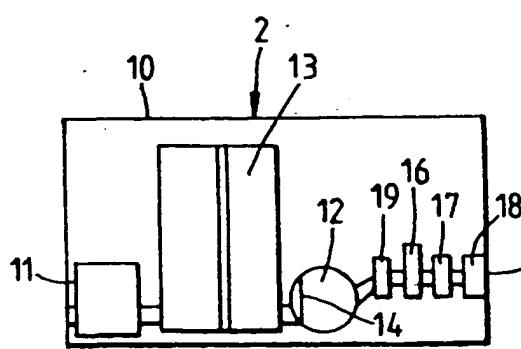


Fig. 5

OXYGEN DISPENSERField of the Invention

The present invention relates to an oxygen dispenser and more particularly
5 although not necessarily exclusively to oxygen vending systems.

Background to the Invention

The benefits of inhaling substantially pure oxygen to compensate for hypoxia
are becoming increasingly broadly appreciated. Most commonly, individuals suffer from
hypoxia following high levels of exertion in a relatively poorly ventilated environment.
10 Such might be the case in a bar or night club particularly but may arise in a health club
or other environment. Indeed, in cities where there is a very high level of atmospheric
pollution from, for example, car exhausts access to substantially pure oxygen or oxygen-
enriched air may be an important factor in maintenance of good health.

Existing sources of substantially pure oxygen supply are conventionally simple
15 oxygen cylinder based systems which have a manual valve for dispensing of the
oxygen by an attendant. This system is, however, impractical for widespread usage
and it is impractical to dispense individual oxygen cylinders to users.

It is a general objective of the present invention to provide an oxygen dispensing
system that is versatile, being suitable for installation in any of a wide range of different
20 environments and usable in an efficient and economic manner.

Summary of the Invention

According to the present invention there is provided an oxygen dispenser for
dispensing substantially pure oxygen or highly oxygen enriched air, which dispenser
comprises an oxygen concentrator or an oxygen/oxygen-enriched air-containing
25 cylinder in fluid communication with a dispenser outlet via pipework, a flow control

valve to control flow of oxygen or oxygen-enriched air to the dispenser outlet, the flow control valve being under the control of a controller, the dispenser unit further having a card reader for a mag-stripe, swipe card, smart card or similar or a receiver for credit tokens or other credit data input means whereby credit units may be input to the 5 dispenser controller to dispense oxygen or oxygen enriched air.

The valve is preferably a solenoid-operated valve and it may suitably be operated by the controller to dispense a predetermined volume of oxygen or oxygen enriched air for each unit of credit input by card or token or other means.

The card is preferably a coded magnetic stripe (mag-stripe) card which may 10 have the one or more credits on the card deleted following use.

In addition to having the automated control of the valve to dispense oxygen or oxygen enriched air in response to the credit data input by the card, tokens or other means, the unit preferably also has means operable by the user to alter flow rate and/or to switch off flow of oxygen or oxygen-enriched air. The dispenser unit suitably has a 15 dispenser outlet to which a nasal or other dispensing cannula or dispensing mask may be fitted for each dispensing operation and which may be automatically cut off from further oxygen or oxygen-enriched air dispensing supply when the mask or cannula is detached from the dispenser outlet.

In contrast to incorporating one or more oxygen cylinders, the dispenser suitably 20 incorporates an oxygen concentrator, providing a substantially inexhaustible supply of oxygen-enriched air.

Brief Description of the Drawings

A preferred embodiment of the present invention will now be more particularly described, by way of example, with reference to the accompanying drawings, wherein:

Figures 1 to 4 are, respectively, a perspective view, a front elevation view, a rear elevation view and a side part sectional view of an oxygen dispenser embodying the invention; and

Figure 5 is a schematic diagram illustrating components of a conventional
5 oxygen concentrator.

Description of the preferred embodiment

Referring to the Figures, the oxygen dispenser comprises a floor standing steel cabinet 1 housing an oxygen concentrator module 2 which is positioned within the cabinet 1 with its air inlet vents exposed to receive air flow from corresponding air inlet
10 vents 3, 3' in the cabinet 1.

The outlet of the oxygen concentrator 2 has delivery pipework 4 coupled to it and extending upwardly towards a dispensing outlet 5 of the dispenser unit.

Part way along the length of the pipework 4 is a solenoid-operated-valve 21 that is adapted to open or close the pipework to permit or stop flow of the oxygen enriched
15 air to the dispenser outlet 5.

Further along the pipe 4 and before the dispenser outlet 5 the pipework 4 enters a flow meter section 8 that is externally manually adjustable by the user to control the rate of flow of oxygen-enriched air during use.

The dispenser outlet 5 comprises a socket to which a nasal cannula or tube
20 leading to an oxygen mask is detachably coupled, in use.

This dispenser outlet 5 is adapted to automatically cut off flow of the oxygen enriched air when the cannula/oxygen mask tube is detached from the dispenser outlet
5.

Delivery of oxygen enriched air from the oxygen concentrator 2 to the dispenser
25 outlet 5 is initiated by activation of the solenoid valve 21 when the electronic controller 7

of the unit registers that one or more appropriate credits have been entered into the dispenser by the user. This is suitably done by inserting a swipe or mag-stripe card into a card reader 8 in the user interface at the upper front of the cabinet. Credit data may also be input by cursor keys, a numeric or alphanumeric keypad 20. Such data may 5 involve a unique user code. A small video display 9 confirms to the user that he has properly supplied the required credit(s) and may indicate how many credits he has remaining and/or the remaining volume or duration of oxygen-enriched air supply that he may receive.

The controller having confirmed that there is a supply of oxygen at a suitable 10 pressure will select an appropriate dispenser outlet 5 if there are several, flash an adjacent indicator, and on confirmation by the user that he has connected himself to the system and is ready, the controller will then deliver a fixed flow of oxygen, for example four litres/minute via a solenoid valve for a pre determined time period or as required by the user.

15 For medical purposes, the swipe card may be encoded with data or signals that correspond to the medical requirements of the individual. This may restrict the duration or rate of supply of oxygen enriched air or possibly enhance it. The card may be of so-called smart card type and capable of logging details such as the parameters of each session of use of the dispenser so that the use and more particularly the nature of the 20 use may be monitored over time.

The normal rate of delivery of oxygen or oxygen enriched air is generally four litres per minute and suitably for a duration of a few minutes. The user may manually adjust flow via the flow meter or the flow may be adjusted for him automatically in accordance with any details pre-programmed onto his card.

With reference to Figure 5, the oxygen concentrator module comprises an inner casing 10 within which is housed a compressor 11 to draw in air and supply it to an oxygen accumulator 12 via sieve beds 13 and filters 14 for particulates. The oxygen enriched air or substantially pure oxygen in the accumulator is then delivered to an 5 outlet 15 via a bacterial filter 16, flow meter 17 and check valve 18. A pressure regulator 19 at the oxygen accumulator 12 maintains the gas within the appropriate pressure levels.

These components of the concentrator 2 may be assembled within the cabinet 1 without use of a separate inner casing 10 and may be configured in any suitable 10 combination.

For multiple users it may be desirable to use, for example, twin concentrators 2 of 5 litres per minute maximum output to serve 3 dispenser outlets in a single dispenser unit 1.

Further refinements to the system may be to incorporate, for example, delivery 15 of fragrance chemical into the supply of oxygen or oxygen enriched air. This may add the benefits of aromatherapy to the existing benefits of the invention.

CLAIMS

1. An oxygen dispenser for dispensing substantially pure oxygen or highly oxygen enriched air, which dispenser comprises an oxygen concentrator or an oxygen/oxygen-enriched air-containing cylinder in fluid communication with a dispenser outlet via pipework, a flow control valve to control flow of oxygen or oxygen-enriched air to the dispenser outlet, the flow control valve being under the control of a controller the dispenser unit further having a card reader for a mag-stripe, swipe card, smart card or similar or a receiver for credit tokens or other credit data input means whereby credit units may be input to the dispenser controller to dispense oxygen or oxygen enriched air.
2. An oxygen dispenser as claimed in claim 1, wherein the valve is a solenoid-operated valve,
3. An oxygen dispenser as claimed in claims 1 or 2 wherein the valve may be operated by the controller to dispense a predetermined volume of oxygen or oxygen enriched air for each unit of credit input.
4. An oxygen dispenser as claimed in any preceding claim, wherein the dispenser has a card reader for a coded magnetic card.
5. An oxygen dispenser as claimed in claim 4, wherein the dispenser deletes the one or more credits on the card following use.
- 20 6. An oxygen dispenser as claimed in claims 1, 2, 3, 4 or 5, wherein in addition to having the automated control of the valve to dispense oxygen or oxygen enriched air in response to the credit data input means, the dispenser also has means operable by the user to alter rate of flow or to switch off flow of oxygen or oxygen-enriched air.

7. An oxygen dispenser as claimed in any preceding claim wherein the dispenser unit has a dispenser outlet to which a nasal or other dispensing cannula or dispensing mask may be fitted for each dispensing operation.
- 5 8. An oxygen dispenser as claimed in claim 7 wherein the dispenser outlet may be automatically cut off from further oxygen or oxygen-enriched air dispensing supply when the mask or cannula is detached from the dispenser outlet.
9. An oxygen dispenser as claimed in any preceding claim, wherein the dispenser incorporates an oxygen concentrator as the source of oxygen or oxygen enriched air.
- 10 10. An oxygen dispenser as hereinbefore described with reference to the accompanying drawings.

Amendments to the claims have been filed as follows

1. An oxygen dispenser for dispensing substantially pure oxygen or highly oxygen enriched air, which dispenser comprises an oxygen concentrator in fluid communication with a dispenser outlet via pipework, a flow control valve to control flow of oxygen or 5 oxygen-enriched air to the dispenser outlet, the flow control valve being under the control of a controller the dispenser unit further having a card reader for a mag-stripe, swipe card, smart card or similar or a receiver for credit tokens or other credit data input means whereby credit units may be input to the dispenser controller to dispense oxygen or oxygen enriched air.
- 10 2. An oxygen dispenser as claimed in claim 1, wherein the valve is a solenoid-operated valve,
3. An oxygen dispenser as claimed in claims 1 or 2 wherein the valve may be operated by the controller to dispense a predetermined volume of oxygen or oxygen enriched air for each unit of credit input.
- 15 4. An oxygen dispenser as claimed in any preceding claim, wherein the dispenser has a card reader for a coded magnetic card.
5. An oxygen dispenser as claimed in claim 4, wherein the dispenser deletes the one or more credits on the card following use.
6. An oxygen dispenser as claimed in claims 1, 2, 3, 4 or 5, wherein in addition to 20 having the automated control of the valve to dispense oxygen or oxygen enriched air in response to the credit data input means, the dispenser also has means operable by the user to alter rate of flow and/or to switch off flow of oxygen or oxygen-enriched air.

7. An oxygen dispenser as claimed in any preceding claim wherein the dispenser unit has a dispenser outlet to which a nasal or other dispensing cannula or dispensing mask may be fitted for each dispensing operation.

5 8. An oxygen dispenser as claimed in claim 7 wherein the dispenser outlet is
automatically cut off from further oxygen or oxygen-enriched air dispensing supply
when the mask or cannula is detached from the dispenser outlet.

9. An oxygen dispenser as hereinbefore described with reference to Figures 1 to 4 of the accompanying drawings.



10

Application No: GB 9909514.3
Claims searched: 1 to 10

Examiner: Mike Henderson
Date of search: 13 July 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK CI (Ed.Q): G4V (VAA VAC VAK VHH VJJ VMA VMB)
Int CI (Ed.6): G07F 15/00
Other: ONLINE:WPI,EDOC,JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
A	US 3799218	(DOUGLASS) (Figs 1 to 5 & corresponding description particularly relevant)	1 to 10
X	DE 4012464	(WURCH) (Whole disclosure relevant)	1 to 5 & 7
X	DE 3908247	(WURCH) (Whole disclosure relevant)	1 to 7

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.